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FURTHER OBSERVATIONS ON THE DEVELOPMENT
OF THE TASTE-ORGANS OF MAN. By FREDERICK
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IN a recent communication to the *Journal* (vol. xxii. p. 559) I gave some account of the development of the taste-organs of man. Since the appearance of my first paper I have had the opportunity, through the kindness of a friend, of investigating the tongues of human embryos of about the tenth and fourteenth week respectively.

Respecting the tongue of the embryo of the tenth week there is but little to remark. The gustatory papillæ were entirely undeveloped, nor was it possible to determine with any degree of certainty their future position. Moreover, the dorsal surface was wholly devoid of papillary elevations of any description. As there was nothing of interest, as far as gustatory structures are concerned, presented by this tongue, I shall here only consider the tongue and papillæ of the foetus of the fourteenth week.

The upper surface of this tongue is more or less marked by papillary elevations of the mucous membrane. The elevations vary greatly in size and shape, and the spaces between them are filled for the most part by epithelium. The epithelial covering of the elevations has an average thickness of about 0.024 mm., and is composed of three rather indistinct layers. The superficial layer consists of slightly flattened cells, which, at its deeper part, become blended with those of the middle layer. The middle layer is much thicker than the preceding, and is composed of nucleated spheroidal or polyhedral cells. Below this is a deep layer consisting usually of a single row of columnar cells. The mucosa is very rich in nuclei, and, at short intervals, is penetrated quite deeply by the proliferations of the epithelium. These proliferations of the epithelium indicate the future position of the glands and their ducts. The striped muscle-fibres of the tongue are clearly shown, but their striæ are exceedingly faint.

Several papillæ of the circumvallate type, in the early stages

of development, are present. One of these papillæ was 0·090 mm. in height, and measured the same in breadth. Another measured 0·096 mm. in height and was 0·11 mm. in diameter. The trenches of the papillæ are undifferentiated, but their future position is clearly indicated. Fungiform papillæ, in various stages of growth, are scattered over the dorsum, and at the sides of the back of the tongue the lateral gustatory organs are sufficiently advanced to be perceptible.

A few bulbs were detected in the circumvallate papillæ of the fœtus, but, unfortunately, little could be learned of their structural details. The best marked bulb was spheroidal in shape, and in some respects resembled those of the soft palate and epiglottis. It measured 0·030 mm. in length and 0·027 in breadth, and was placed vertically in the long axis of the papilla, with its lower two-thirds resting in a cavity of the mucosa. The outer extremity of the bulb penetrated the superficial layers of the epithelium.

In this embryo the bulb-bearing papillæ were usually smaller, while the bulbs themselves were larger than those of the fœtus of the end of the fourth month, the tongue of which I had previously studied.

While embryonic taste-bulbs were wanting in the tongue of a ten weeks' embryo, it is not improbable that they may yet be found in the incipient stages of growth in one of the twelfth week of intrauterine life.

